

This Page Is Inserted by IFW Operations
and is not a part of the Official Record

BEST AVAILABLE IMAGES

Defective images within this document are accurate representations of the original documents submitted by the applicant.

Defects in the images may include (but are not limited to):

- BLACK BORDERS
- TEXT CUT OFF AT TOP, BOTTOM OR SIDES
- FADED TEXT
- ILLEGIBLE TEXT
- SKEWED/SLANTED IMAGES
- COLORED PHOTOS
- BLACK OR VERY BLACK AND WHITE DARK PHOTOS
- GRAY SCALE DOCUMENTS

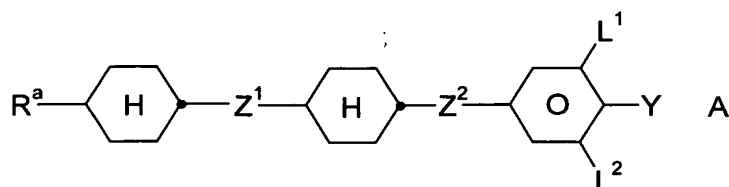
IMAGES ARE BEST AVAILABLE COPY.

**As rescanning documents *will not* correct images,
please do not report the images to the
Image Problem Mailbox.**

Patent Claims

1. A liquid-crystalline medium comprising one or more compounds of formula A

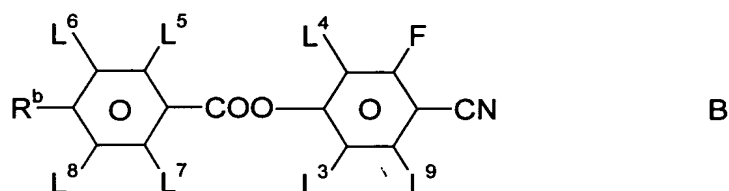
5



10

and at least one compound of formula B

15



20

in which

25 R^a and R^b are each, independently of one another, H or an alkyl radical having 1 to 12 carbon atoms which is unsubstituted or monosubstituted by CN or CF_3 , or at least monosubstituted by halogen, in which one or more CH_2 groups are optionally, independently of one another, replaced by $-O-$, $-S-$, $-\text{cyclohexyl}-$, $-\text{CH}=\text{CH}-$, $-\text{C}\equiv\text{C}-$, $-\text{CO}-$, $-\text{CO}-\text{O}-$, $-\text{O}-\text{CO}-$ or $-\text{O}-\text{CO}-\text{O}-$ in such a way that O atoms are not linked directly to one another,

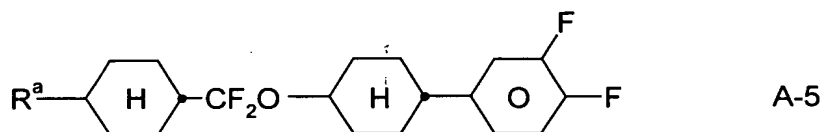
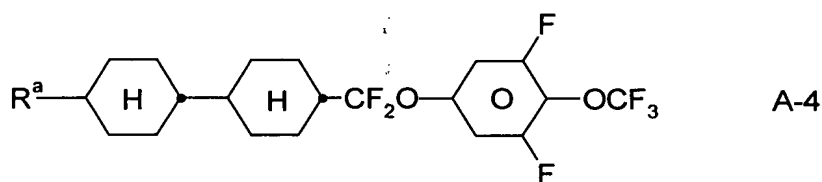
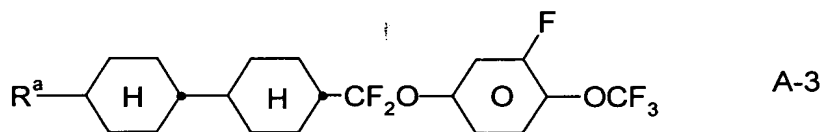
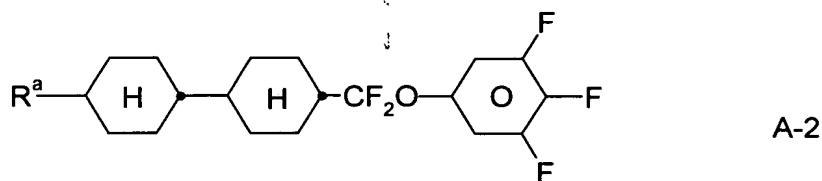
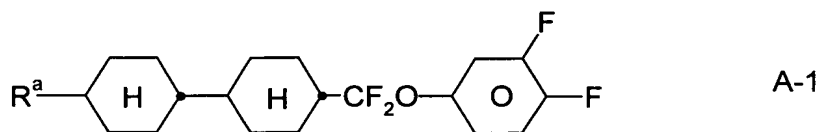
30

35 Z^1 and Z^2 are each, independently of one another, $-(CH_2)_4-$, $-\text{CF}_2\text{O}-$, $-\text{COO}-$, $-\text{OCF}_2-$, $-\text{OCH}_2-$, $-\text{CH}_2\text{O}-$, $-\text{CH}_2-$, $-(CH_2)_3-$ or a single bond, wherein at least one of Z^1 and Z^2 is $-\text{OCF}_2-$ or $-\text{CF}_2\text{O}-$,

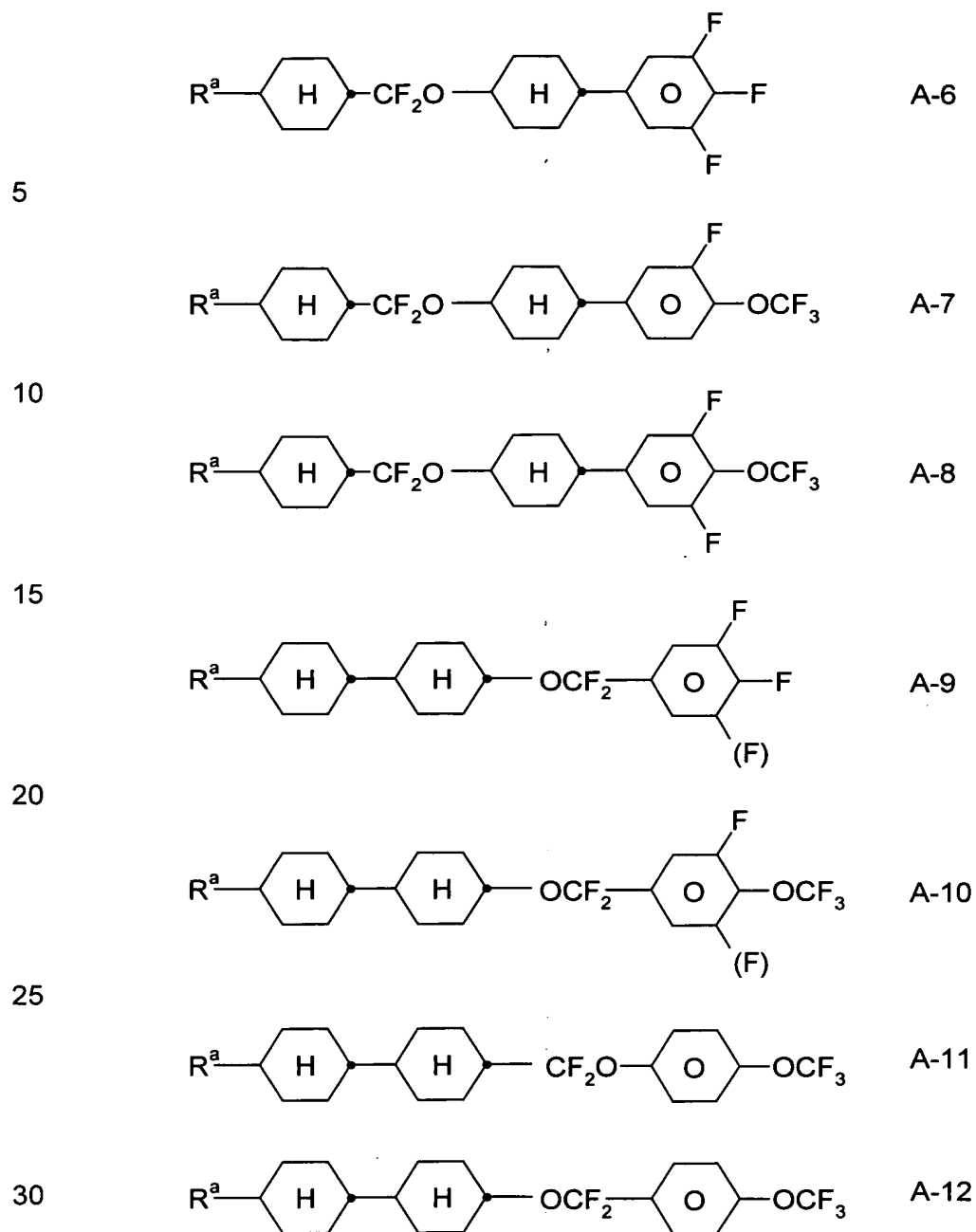
L^1 to L^9 are each, independently of one another, H or F, and

Y is F, Cl, SF_5 , NCS, OCN, CN, SCN, or a monohalogenated or polyhalogenated alkyl, alkoxy, alkenyl or alkenyloxy radical, each having up to 5 carbon atoms.

2. A liquid-crystalline medium according to Claim 1, comprising a compound of formulae A-1 to A-12

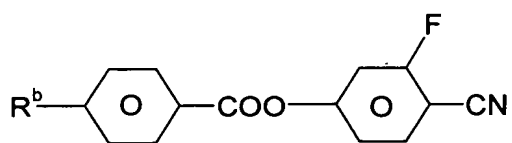


35



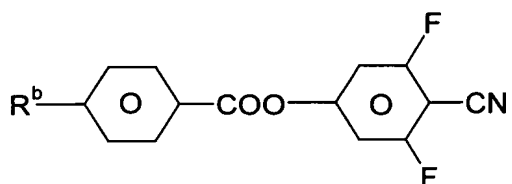
in which R^a is as defined in Claim 1.

- 35
3. A liquid-crystalline medium according to Claim 1, comprising a compound of formulae B-1 to B-6



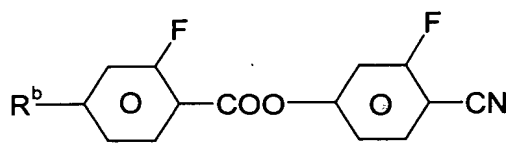
B-1

5



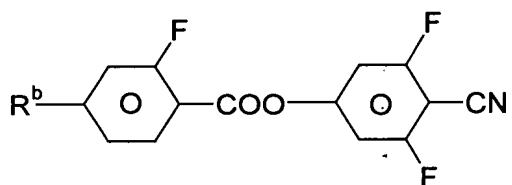
B-2

10



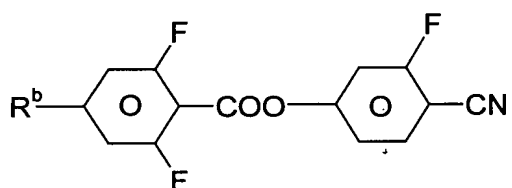
B-3

15



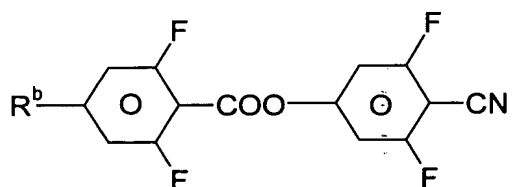
B-4

20



B-5

25



B-6

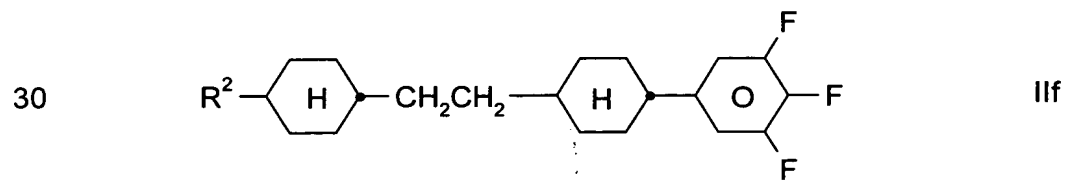
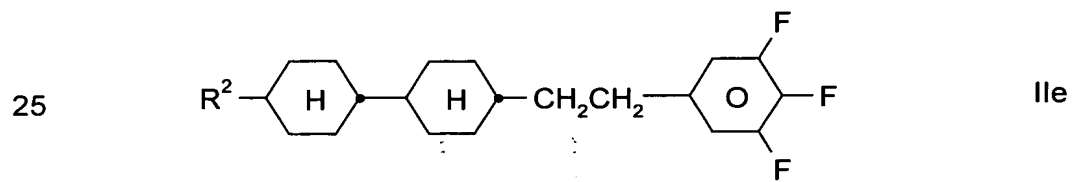
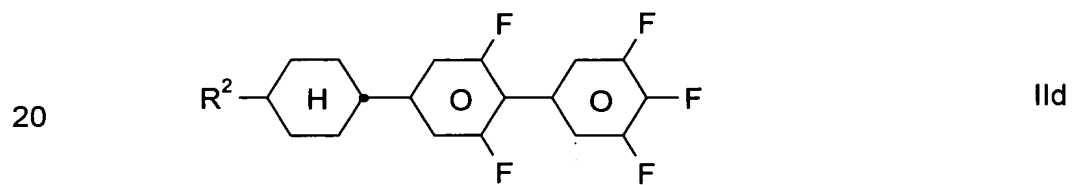
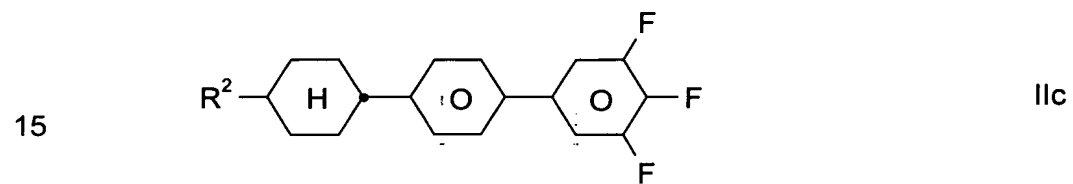
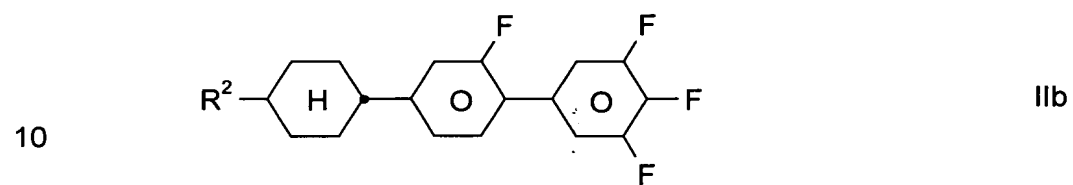
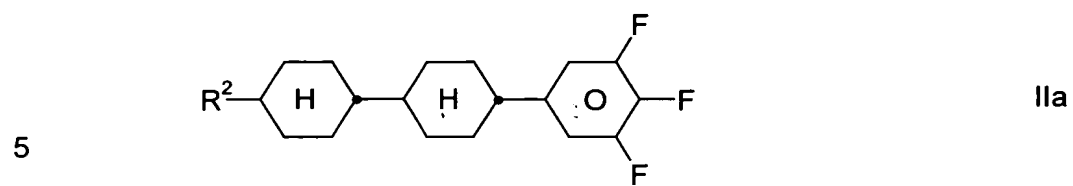
30

in which

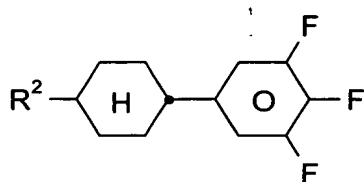
R^b is as defined in Claim 1.

35

4. A liquid-crystalline medium according to Claim 1, further comprising a compound of formulae IIa to IIj

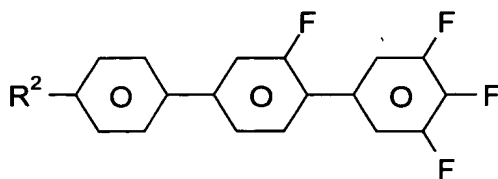


35



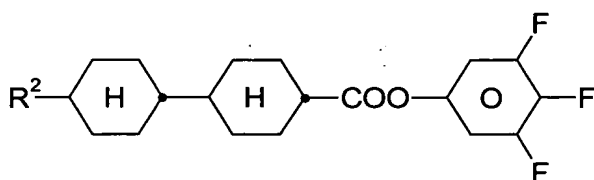
IIg

5



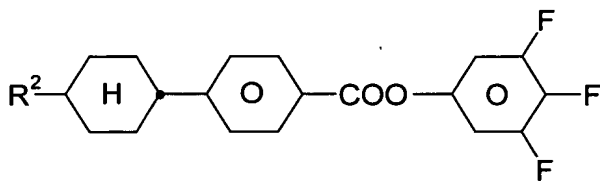
IIh

10



IIi

15



IIj

20

in which

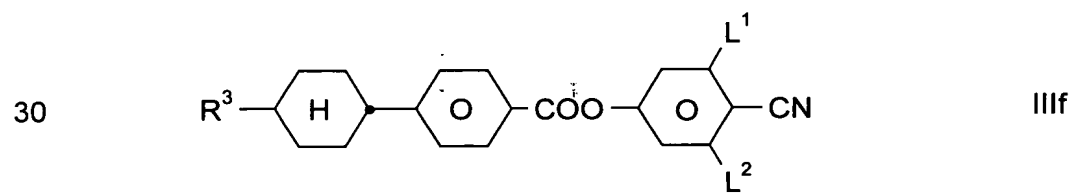
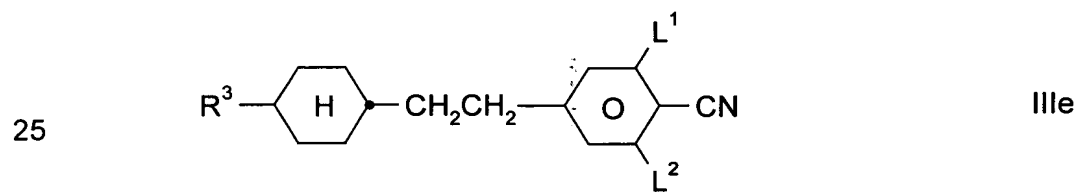
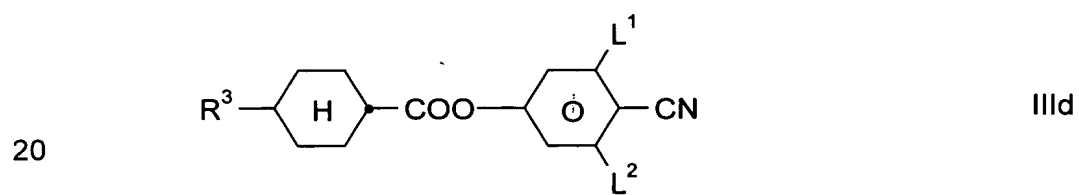
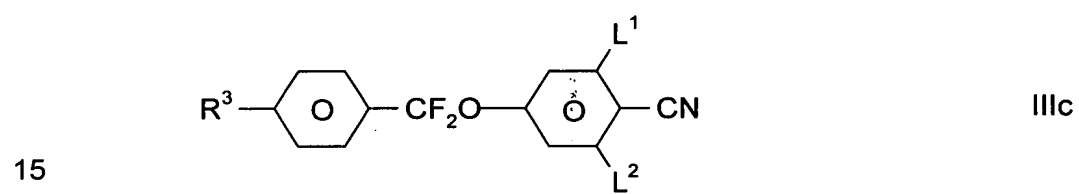
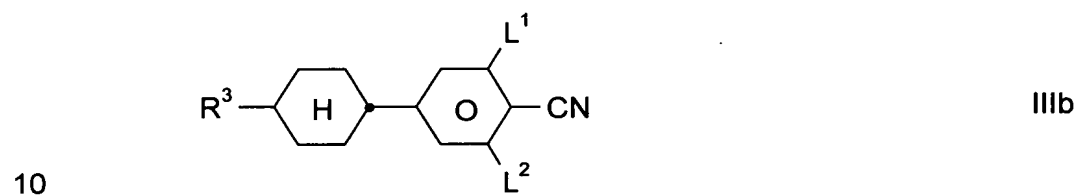
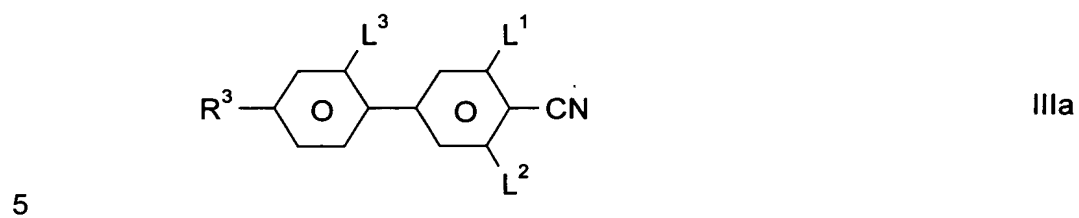
R^2 is an alkyl radical having 1 to 12 carbon atoms which is unsubstituted or monosubstituted by CN or CF_3 , or at least monosubstituted by halogen, in which one or more CH_2 groups are optionally, independently of one another, replaced by $-O-$, $-S-$, $\text{—}\diamond\text{—}$, $-CH=CH-$, $-C\equiv C-$, $-CO-$, $-CO-O-$, $-O-CO-$ or $-O-CO-O-$ in such a way that O atoms are not linked directly to one another.

25

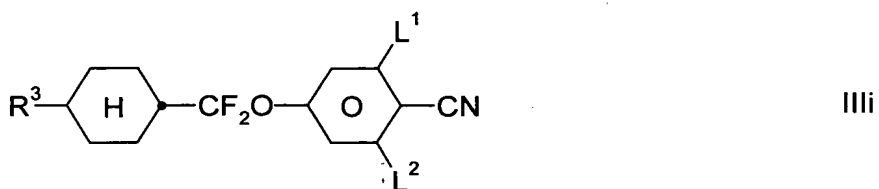
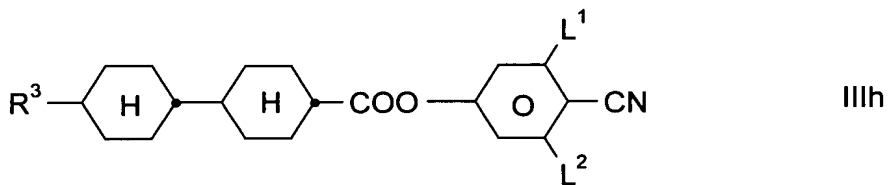
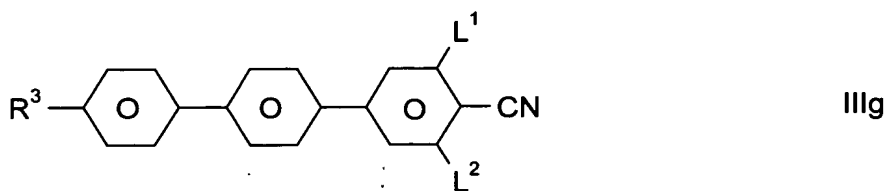
30

5. A liquid-crystalline medium according to Claim 1, further comprising a cyano compound of formulae IIIa to IIIi

35



35



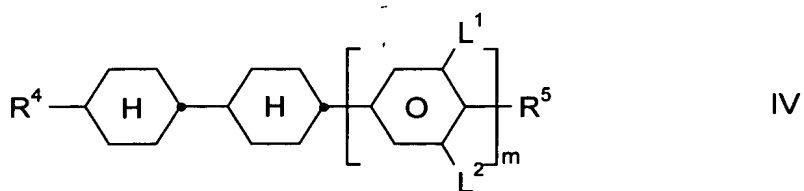
in which

20 R^3 is an alkyl radical having 1 to 12 carbon atoms which is unsubstituted or monosubstituted by CN or CF_3 , or at least monosubstituted by halogen, in which one or more CH_2 groups are optionally, independently of one another, are replaced by $-O-$, $-S-$, $\text{—}\diamond\text{—}$, $-CH=CH-$, $-C\equiv C-$, $-CO-$,
25 $-CO-O-$, $-O-CO-$ or $-O-CO-O-$ in such a way that O atoms are not linked directly to one another, and

30 L^1, L^2
and L^3 are each, independently of one another, H or F.

6. A liquid-crystalline medium according to Claim 1, further comprising a compound of formula IV

35



in which

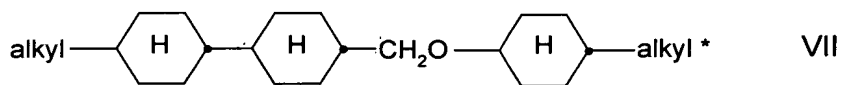
m is 0 or 1,

R^4 is an alkenyl group having 2 to 7 carbon atoms,

R^5 is defined as R^a in claim 1, or, when m is 1, is alternatively F, Cl, CF_3 or OCF_3 , and

L^1 and L^2 are each, independently of one another, H or F.

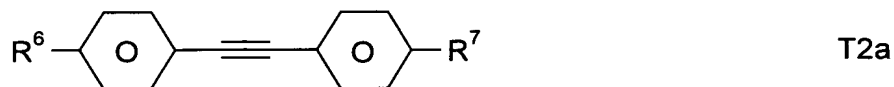
7. A liquid-crystalline medium according to Claim 1, further comprising a compound of formula VII

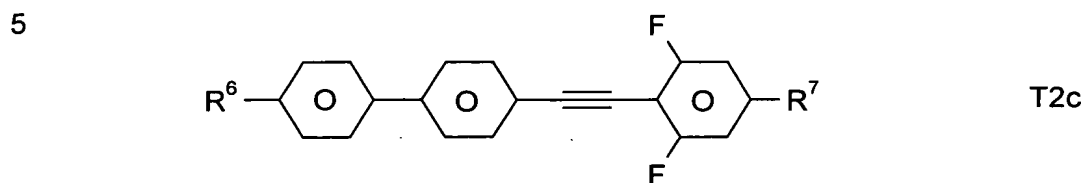
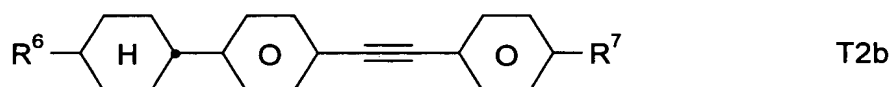


in which

alkyl and alkyl* are each, independently of one another, an alkyl group having 1 to 7 carbon atoms.

8. A liquid-crystalline medium according to Claim 1, further comprising a tolan compound of formula T2a, T2b or T2c





10

in which

R^6 and R^7 are each, independently of one another, an alkyl radical having 1 to 12 carbon atoms which is unsubstituted or monosubstituted by CN or CF_3 , or at least monosubstituted by halogen, in which one or more CH_2 groups are optionally, independently of one another, replaced by $-\text{O}-$, $-\text{S}-$, $\text{—}\diamond\text{—}$, $-\text{CH}=\text{CH}-$, $-\text{C}\equiv\text{C}-$, $-\text{CO}-$, $-\text{CO}-\text{O}-$, $-\text{O}-\text{CO}-$ or $-\text{O}-\text{CO}-\text{O}-$ in such a way that O atoms are not linked directly to one another.

9. A liquid-crystalline medium according to Claim 1, wherein the medium comprises 5-30% by weight of one or more compounds of formula A.
10. A liquid-crystalline medium according to Claim 1, wherein the medium comprises 5-30% by weight of one or more compounds of formula B.
11. A liquid-crystalline medium according to Claim 1, wherein the medium comprises more than 20% of compounds having a dielectric anisotropy of $\Delta\epsilon \geq +12$.
12. An electro-optical device comprising a liquid-crystalline medium according to Claim 1.
13. An electro-optical liquid-crystal display containing a liquid-crystalline medium according to Claim 1.

14. A TN or STN liquid-crystal display comprising

- 5 – two outer plates, which, together with a frame, form a cell,
- a nematic liquid-crystal mixture of positive dielectric anisotropy located in the cell,
- electrode layers with alignment layers on the insides of the outer plates,
- 10 – a tilt angle between the longitudinal axis of the molecules at the surface of the outer plates and the outer plates of from 0 degree to 30 degrees, and
- a twist angle of the liquid-crystal mixture in the cell from alignment layer to alignment layer with a value of between 22.5° and 600°, and
- 15 – a nematic liquid-crystal mixture comprising
 - 20 a) 15 – 75% by weight of a liquid-crystalline component A consisting of one or more compounds having a dielectric anisotropy of greater than +1.5;
 - b) 25 – 85% by weight of a liquid-crystalline component B consisting of one or more compounds having a dielectric anisotropy of between -1.5 and +1.5;
 - 25 c) 0 – 20% by weight of a liquid-crystalline component D consisting of one or more compounds having a dielectric anisotropy of below -1.5, and
 - 30 d) optionally, an optically active component C in such an amount that the ratio between the layer thickness and the natural pitch of the chiral nematic liquid-crystal mixture is from about 0.2 to 1.3,

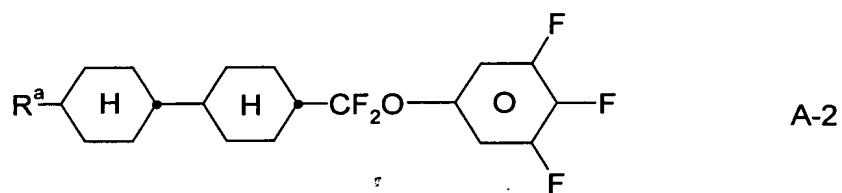
35 wherein component A is a liquid-crystalline medium according to claim 1.

15. A liquid-crystalline method according to claim 2, comprising a compound of formula A-2 or A-6.

5 16. A liquid-crystalline method according to claim 3, comprising a compound of formula B-1, B-2 or B-4.

17. A liquid-crystalline method according to claim 1, comprising a compound of formula A-2

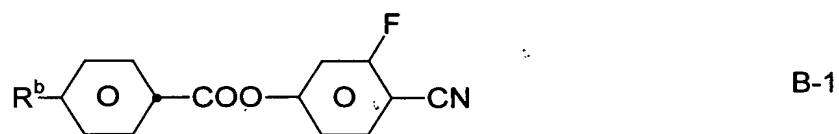
10



15

and a compound of formula B-1

20



wherein in R^a and R^b are as defined in claim 1.

25

18. A liquid-crystalline method according to claim 1, wherein the medium contains three homologous compounds of formula A.

30

35